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396 501 practise, which involved much unnecessary labor, is given by Porter (*49*, pp. 101-102). He says:

[422] Each piece, and indeed each paddle has its separate proprietor. To one belongs the piece projecting from the stern, to another the part forming the bow. The pieces forming the sides belong to different persons and when a canoe is taken to pieces, the whole is scattered throughout the valley and divided, perhaps, among twenty families. Each has the right of disposing of the part belonging to him, and when it is to be set up each brings his piece with materials for securing it. The setting up of a war canoe goes on with the same order and regularity as all their other operations.

Mention of this curious system of ownership is also made by Desgraz (*15*, pp. 281-282) but as his book appears to be a little more than a compilation from earlier sources, this can hardly be taken as a verification.

It seems certain that there must have been a definite order in which the various sections were placed in position, but no exact information was obtained on this point. The structure of the canoes, however, partially indicates the following sequence:

The first step must have been to arrange the pads which took the place of caulking between structures or sections. There were four of these, two being placed along the sides of the underbody and one at either end. The side pads consisted of two thick flat ropes, of the same length as the underbody, each of which was plaited from three strands of coconut husk fiber. Cellular tissue of the husk was left adhering to this fiber, probably with the idea of filling the interstices and making the finished seam more nearly water tight. These ropes were laid along either edge of the underbody, being held in position by continuous bark strings which fastened them to the underbody at each lashing hole. The end pads were made from a number of the fiberous leaf sheaths of the coconut which were spread out flat with their upper ends resting on the top of the underbody and their lower ends bending down over its flat vertical bow and stern. They do not seem to have been attached to the underbody in any way.

The next step was to place the bow and stern pieces in position, and then the side planks. Whether the bow and stern pieces were attached before the side planks were put on is uncertain, but it seems probable that the whole superstructure was lashed to the underbody in a single continuous operation. In the models the lashing of each side is done with a single continuous line, beginning at the bow.

[284] The lashings were of broad three-plait coconut fiber cord considerably heavier than that used for house lashings. This was passed several times through the upper and lower lashing holes, outside of the strips, the outer side of the lashing being flat, the full width of the hole, and only one cord thick. According to one informant a large wooden needle, with the point barbed on one side was used to facilitate passing the cord in and out. (See section on Miscellaneous Tools.) The upper ends of the side planks were attached to the bow and stern pieces by small lashings, each of a single piece of cord tied on the inside. The inside lashings are said to have been ornamented on some canoes with designs derived from string figures.

CAULKING

501 396 314 [237] The lashings of the underbody and superstructure did not completely fill the triangular holes provided for them, and the openings were caulked with pieces of coconut husk wadded up and beaten in with a wooden mallet and pointed stick. (See section on Miscellaneous Tools.) The seams at the ends of the canoe were calked with feathers, beaten in. [48]

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with feathers, beaten in. Langsdorff (38, p. 173) says that the seams were covered with the gum of the breadfruit tree, but this was not mentioned by informants or by any other early visitor. All accounts agree that the craft leaked so badly that one or two men were kept constantly employed bailing.

THE OUTRIGGER

All canoes, when not fastened together in pairs, were provided with outriggers. Quiros (50, p. 28) says that they had "outriggers of cane on either side, after the manner of the gunwales of galleys." Porter (49, p. 102) also mentions the use of double outriggers in connection with large canoes differing somewhat from the type now under discussion. Canoes appear, however, to have been normally fitted with a single outrigger on the right side.

This outrigger was of indirect type, consisting of crosspieces, uprights and a float. In the smaller craft two crosspieces only were used, in the larger canoes there were three, the third being in the middle. These crosspieces passed over the canoe, their right ends projecting beyond it, and were lashed firmly to the side planks by cords passed through holes in the upper edges of the side planks.

Each of the uprights consisted of four or six small sticks or splints. When four sticks were used they were placed two on either side of the crosspiece, and the lower ends of each pair rested together, the upper ends being some inches apart so that they formed a V. Each of these V's in turn sloped outward from the crosspieces; their attachments to the float were a foot or more apart. Informants say that this form of upright, although much more difficult to make than the modern one, was superior to it. In landing through a heavy surf the forward end of the float often strikes bottom, and with the modern heavy upright the canoe is turned end over end. When the old upright was used the thin sticks of which it was composed broke easily, and the canoe would land without capsizing. The lower ends of the uprights were wedged into slots in the upper surface of the float, which consisted of a hibiscus log sharpened at the forward end.

CANOE PLATFORMS

According to old accounts the large war canoes were provided with platforms at bow and stern, while Porter (49, p. 101) mentions an additional central platform on which the chief sat. The use of such platforms is only vaguely remembered by the natives and these platforms are not shown in the newer models. Stewart (59, p. 244) says that the platform was made of small sticks and covered with a mat, and that the stern platform was considerably higher than the one in the bow. In two old models the stern platforms are made as follows:

Two rather large peeled sticks were laid across the canoe, the inner stick being close behind the forward end of the stern piece while the outer was just in front of the breakwater. Two other poles were then laid across the ends of these, lengthwise of the canoe, and the whole lashed to the side planks with bark rope passed through holes in the canoe. The rear ends of the second pair of poles projected slightly beyond the stern breakwater. Two more cross poles were laid on the ends of these, above which two very long poles were placed lengthwise, their tips projecting back almost to the tip of the upward curving tail. The four upper poles were then lashed to the frame formed by the four lower ones. The bow platform was built on the same principle except that the tops of the second set of poles were flush with

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CONTAINERS

The Marquesans use a great variety of containers which may be divided into two main classes: natural containers, such as bamboos, coconut shells and gourds, which need little preparation for use; and wooden containers, which require considerable skill in manufacture. The wooden containers are by far the more important in the Marquesas and are well represented in most museum collections.

NATURAL CONTAINERS

JOINTS OF BAMBOO

The Marquesans, like all peoples living in regions where the larger species of bamboo grow, used joints of bamboo to transport and store fluids. Small bottles, made from a single joint, do not appear to have been used, as their place was taken by more convenient utensils of gourd or coconut shell. Large bottles were made by cutting bamboo shoots three inches or more in diameter into sections from 10 to 20 feet long and piercing the septa between the joints, forming a pipe closed at one end. The piercing is now done with an iron rod heated red; the ancient method could not be ascertained. When in use the upper end of the tube was filled with a plug of green leaves. Bamboo bottles were purely utilitarian and were never decorated.

COCONUT SHELLS

The climate and soil of the Marquesas are ideally adapted for the growth of coconuts, the trees bearing profusely and producing nuts of remarkable size. It is not surprising, therefore, that the natives made an extensive use of coconut shells as containers and that they developed considerable skill in the manufacture and decoration of utensils of this kind.

The half shell of a coconut constituted a natural cup which could be used without preparation. The first improvements upon this original form appear to have been the smoothing of the edge by grinding and the removal, also by grinding, of the small external point which prevented the cup from standing upright. Cups and bowls made in this way are still occasionally used. The next step is to remove the tough inner skin and rub the outer surface smooth; rubbing-stones and burnishers are used for this work. As a final improvement the cups were either carved or ground thin. Carved cups were given a smooth finish and then decorated by the same methods and with the same designs as wooden containers. To make the thin, uncarved cups both the outer and inner surfaces were ground away until the walls were only slightly thicker than egg shell china. They were then thoroughly impregnated with oil, making them elastic and capable of withstanding quite heavy usage. When first finished, the surfaces of coconut